IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OKLAHOMA

STATE OF OKLAHOMA,	)	
	)	
Plaintiff,	)	
	)	
v.	)	**Case No: 05-CV-0329-GKF-SAJ**
	)	
TYSON FOODS, INC., et al.	)	
	)	
Defendants.	)	

AFFIDAVIT OF DARREN L. BROWN

I, Darren L. Brown, of lawful age, being first duly sworn upon oath, state:

A. Introduction

1. I have worked for Camp, Dresser and McKee ("CDM") since August 1987, with a five-month hiatus between August 1990 and January 1991 and a two-year hiatus between July 2003 and July 2005. I have worked in the environmental consulting field since May 1986. I earned a Bachelor of Science Degree in Geological Engineering from the Colorado School of Mines in 1984 and Master of Science Degree in Geology from the University of Oklahoma in 1987. I am a Licensed Geologist in the State of Kansas (License No. 403) and received my Engineer in Training Certification from the State of Colorado in 1984 (#12425).

2. I have been the project manager for the Oklahoma Poultry Project since 2006. In addition to project management, my duties have included: working to develop the groundwater sampling program, the soil and litter sampling program, and the 2006 and 2007 river sampling programs; staffing and coordinating all field programs in 2006 and 2007; and field sampling, including soil and litter sampling, when necessary. Sampling programs

EXHIBIT
F

conducted while I have been project manager include: litter and soil sampling; high and base flow sampling; edge of field (runoff) sampling; groundwater sampling (both residential well sampling and direct push sampling); spring sampling; river sampling (including fish and benthic macroinvertebrate sampling); lake sampling (Tenkiller, Stockton, and Broken Bow); public water supply sampling; and manure sampling. My development and scoping of the soil and litter sampling programs, the groundwater sampling program, and most of the other programs identified above was based upon my twenty-one years of environmental consulting experience including developing approved work plans and sampling plans for EPA, State regulatory agencies, and private clients. Additionally, I have led portions of the field sampling programs for five separate Federal Superfund projects and dozens of State-lead Remedial Investigation programs.

3. The actual Standard Operating Procedures ("SOPs") utilized by CDM field crews in conducting sampling activities on behalf of the State are attached hereto as follows:

Exhibit A – "Soil and Litter/Manure Sampling Protocol" ("2006 Soil and Litter SOP 1") available to field crews during pre-June 29, 2006 sampling efforts;

Exhibit B – "Soil and Litter/Manure Sampling Protocol" ("2006 Soil and Litter SOP 2") available to field crews by June 29, 2006 sampling efforts;

Exhibit C – "Litter and Soil Sampling", Revision 9* ("2007 Soil and Litter SOP") available to field crews during the 2007 sampling effort;

Exhibit D – Spring Sampling SOP available to field crews during 2006 sampling effort;

Exhibit E – Current Spring Sampling SOP;

Exhibit F – Groundwater Sampling SOP available to field crews during 2006 sampling effort;

Exhibit G – Current Groundwater Sampling SOP.

4. I have read the "Report of Sampling Oversight Observations" prepared by Jay Churchill ("Mr. Churchill") on behalf of Defendants in the case at bar. I have also read Mr. Churchill's testimony as a witness for Defendants during the hearing on the State's Motion for Preliminary Injunction. In my review of Mr. Churchill's report and testimony, I noted several factual and analytical errors, omissions and misrepresentations. I have drafted this Affidavit in an effort to document some of these observed errors, omissions and misrepresentations.

B. SOP Confusion

5. In his report and testimony, Mr. Churchill did not adequately identify the document he relied on in asserting that CDM had violated soil and litter sampling protocol. First, Mr. Churchill omits any reference of or citation to the 2007 Soil and Litter SOP (attached hereto as Exhibit C). The 2007 Soil and Litter SOP contains an entire subsection setting out the specific "Decontamination Procedures" to be followed by CDM (Exhibit C, at 9 – 10, ¶ 4.6). Because he makes no reference to the 2007 Soil and Litter SOP, Mr. Churchill has offered no opinion as to whether CDM violated any provision of the 2007 Soil and Litter SOP. The SOP of Exhibit C is the SOP against which CDM soil and litter sampling should be evaluated.

6. Mr. Churchill identifies a document titled "Soil and Litter/Manure Sampling Protocol" and refers to it as a "Work Plan" in his report and testimony. However, Mr. Churchill fails to specify which "Soil and Litter/Manure Sampling Protocol" he is referring to. As noted above, in 2006, CDM used two different SOPs entitled, "Soil and Litter/Manure Sampling Protocol," 2006 SOP 1 and 2006 SOP 2 (Exhibits A and B). Also, CDM has never

characterized the 2006 SOP 1 or 2006 SOP 2 as "Work Plans." CDM characterized these documents as SOPs.

C. Table 1 to Mr. Churchill's Report and Exhibit D-36

7. In Mr. Churchill's testimony, he provided an exhibit titled Defense Demonstrative Exhibit D-36. This exhibit is a table with columns having the following identifications: "Field Issues Observed," "Number of Fields Compromised," "Percentage of Fields Compromised," "Number of Farms Compromised," and "Percentage of Farms Compromised." Mr. Churchill asserts that this table was derived from Table 1 in his report. Defense Demonstrative Exhibit D-36 misrepresents Table 1 to Mr. Churchill's report. Table 1 identifies the number of occurrences of a specific issue within each sampling area. In converting Table 1 to Exhibit D-36, Mr. Churchill makes the conclusion that one occurrence of an observed issue in a field compromises the entire field result with respect to the observed issue. For instance, the issue "Sampler Driven through Cow Manure" was identified in one occurrence for LAL11-C. This represents one occurrence in 40 or more core samples collected from LAL11-C, and or one occurrence in over 120 soil samples collected from LAL11-C. Mr. Churchill then characterizes that one occurrence as a "Compromised" field and a "Compromised" farm. Mr. Churchill fails to provide any kind of evaluation to demonstrate how the entire field or farm is classified as "compromised" from a limited number of observed issues. I have reviewed Roger Olsen's affidavit and am in full agreement that the data collected under the supervision of CRA staff is representative and usable for the purposes of this study and that where otherwise noted, the data should not be considered compromised or otherwise negatively mischaracterized. Based upon my observations and direct experience of other field activities in the watershed, I believe that the

other field data collected for this program and qualified as usable by CDM data reviewers should be considered as representative and viable information.

8. Mr. Churchill's Table 1 indicates a minimum number of 1701 cores collected in 2006 (through LAL-18). His core count in Table 1 for 2007 locations is incomplete. CDM's data indicates that approximately 760 cores were collected in 2007 (minimum 2 cores per location). For a total minimum number of 2471 cores, Mr. Churchill's Table 1 tally of cores advanced through cow manure is 21 samples. Even accepting his overall count as correct,[1] this represents a maximum of 0.8 percent of all sample cores collected under Conestoga-Rovers & Associates ("CRA") oversight. Mr. Churchill's assertion that 16 percent of the sampled fields are compromised and 53 percent of the sampled farms are compromised due to cores advanced through cow manure is a misrepresentation of the data.

D. Alleged Violations of the Soil and Litter SOPs

Overview

9. In his CRA report, Mr. Churchill claims the following actions violate Sections III.A.4.b and/or III.A.6 of the CDM "Work Plan":

- Advancing the sample probe directly through cow manure during soil sampling, which would have resulted in cow manure and associated nutrients being introduced directly into the soil samples.
- Dropping sample equipment in cow manure, resulting in contamination of gloves and sampling equipment prior to collecting soil samples.
- Cow manure visible on sample probe prior to sample collection.
- Failure to consistently and sufficiently decontaminate field equipment at the start of daily sampling, between grids, or after visible contamination from soil and cow manure.
- The sampling knife was not cleaned between sample locations and depths, and residual soil was routinely visible on the knife prior to sample collection.
- Stepping in fresh cow manure then on the corner of the sample triangle prior to advancing soil sampling probe.

[1] CDM has not yet had time to verify whether Mr. Churchill's numbers are consistent with the data reported in the CRA field books.

- Clearing vegetation and organic matter from sample location with nitrile gloved hands introducing surficial soil, vegetation, and organic matter to the gloves and to subsequent soil samples handled with nitrile gloves.
- Not changing soiled nitrile gloves between sub-samples after coming into contact with cow manure and shallower soil intervals.
- Soiled nitrile gloves were not changed between individual sample grids or fields.
- Touching soil samples directly with soiled nitrile and cotton gloves and non-gloved fingers.
- CDM personnel placing bare fingers and soiled nitrile gloves inside sample bag. This includes placing sample bag labels on the inside of the sample bags prior to arriving at the site to commence sampling activities.
- Tipping the sample probe to empty all remaining soil into sample bag.
- As sample material from shallower depth intervals was dragged into plastic sample bags from the tip of the sample probe, soil material remaining in the sample probe from the deeper depth intervals also was dragged into the sample bags for the shallower samples, which is a violation of Section III. A. 4. b. of the CDM Work Plan.
- Advancing the sample probe deeper than 6 inches and using the same sample knife to remove soils deeper than 6 inches in depth, which is a violation of Section III. A. 4. b. of the CDM Work Plan.

10. Mr. Churchill's assertion that CDM has violated either Section III.A.4.b or Section III.A.6 of any version of the Soil and Litter SOP (Exhibits A, B and C) with respect to the issues identified above is false. First, the 2007 Soil and Litter SOP does not even contain a Section III.A.4.b or A.6. In any event, none of the attached Soil and Litter SOPs (Exhibits A, B and C) require that decontamination be performed between discrete in-core soil samples or between soil samples within a sampling area grid.

11. None of the attached Soil and Litter SOPs specify how the thatch material is to be removed from the surface prior to sampling.

12. None of the attached Soil and Litter SOPs provide that the sample probe cannot be tipped to empty remaining soil sample into the bag.

13. None of the attached Soil and Litter SOPs specify how sample depths are to be physically segregated in the sample core or how to handle core material from greater than a six-inch depth.

Compositing of Soil and Litter Sample

14. Mr. Churchill asserts that cow manure, grass, roots, and other vegetative matter were incorporated into soil samples collected by CDM. First, the CDM soil preparation laboratory did not observe any instances of recognizable cow manure in the soil samples. Second, after collection of the soil samples from each sampling area, CDM laboratory personnel dried, disaggregated, sieved, and composited the samples into one sample. CDM laboratory personnel removed all material such as rocks, grasses, and root material during the compositing process through a combination of manually picking out the material and through discarding whatever failed to pass through the sieve. As a result of this compositing process, any impact of material such as grass, roots, or dried cow manure passing through the sieve screens would be insignificant both in volume and by mass.

15. Mr. Churchill asserts that litter samples in the bucket were poorly mixed and not properly composited prior to extracting a smaller aliquot for CRA and CDM. CDM strongly denies that the compositing effort in the bucket was inadequate and poorly mixed.

16. Depending upon the amount of cake (very moist, clumped material) in the collected samples, mixing occurred for approximately one to four minutes. Samples with significant amounts of cake required more effort to composite. I conducted the litter sampling at 12 of the 17 facilities identified in Mr. Churchill's report. I initiated the mixing using the shovel to turn over the sample within the bucket. The shovel was inserted to the bottom of the bucket and manipulated to bring the deeper material to the surface. The shovel

was also used to break up the caked material and mix it with the non-cake litter. After mixing with the shovel, I switched to a hand trowel to further assist in the breakup of cake material into smaller fragments. Once I assessed the material as sufficiently mixed, a small aliquot of material was extracted from the bucket into a sterile 500 ml container (1000 ml if a duplicate sample was collected). This aliquot was submitted via overnight courier to a laboratory for bacterial analyses. I believe that the samples submitted for bacterial analysis were representative of the litter samples collected from the poultry houses.

17. At the time of CDM's aliquot collection, CRA also provided bottles for their own analyses. The volume requested by CRA was usually a minimum of three glass jars with an estimated total volume of 32 ounces. The remaining material was shipped via courier to the CDM Denver laboratory for proper compositing per CDM's SOP 5-2. After compositing at the CDM Denver laboratory, the remaining volume was split between CRA and the laboratories selected by CDM to conduct the remaining analyses.

The "Shovel" and Clearing Organic Matter

18. In his testimony, Mr. Churchill asserts that the unspecified version of the Soil and Litter Work Plan requires CDM to use a shovel to remove vegetation from the ground surface prior to advancing the probe. This is a false assertion. Regardless of which of the attached versions of the Soil and Litter SOPs (Exhibits A, B, and C) Mr. Churchill referenced, they require the use of a shovel to clear thatch and other plant residue only when using a shovel to collect the soil samples. Additionally, the terms "residue" and "thatch" in Exhibits A, B, and C imply loose material, not material that is fixed in place.

19. Mr. Churchill asserts that CDM did not collect representative samples of the litter by using a curved edge shovel that would limit the ability to collect an equal volume of

litter throughout its depth. Mr. Churchill's CRA report indicated that failure to collect an equal volume throughout the depth of the litter was a violation of OSU Factsheet F-2248, which states, "Collect the entire depth of the litter..," and also Section IV.C.3. of the CDM "Work Plan." These assertions are false. None of the attached Soil and Litter SOPs (Exhibits A, B and C) requires that an equal portion of the litter must be collected through the full thickness; the SOPs only require that the full thickness should be sampled. CDM contends that the litter samples collected from the facilities are representative, other than the single example of the sample from FAC-06 which had excessive soil material inadvertently collected from the first five or six grid locations due to poor lighting conditions in the facility preventing adequate assessment of the litter thickness. The collection of the soil material appears to have impacted a number of the analytical results for FAC-06, mostly diluting the results.

20. In his report, Mr. Churchill falsely asserts that failure to clear vegetation and organic matter prior to driving the sample probe violates some version of the Soil and Litter SOP. None of the attached Soil and Litter SOPs (Exhibits A, B, and C) require the removal of fixed vegetation from the surface prior to driving the sample probe.

Decontamination between Discrete Soil Samples

21. During his testimony, Mr. Churchill asserted that the "Work Plan" requires decontamination to be carried out between each discrete soil sample collected from each depth at a core hole. Mr. Churchill further asserted that CDM violated its Work Plan by not doing so. His report specifies the violation of Section III.A.6. This is a false assertion. None of the attached Soil and Litter SOPs (Exhibits A, B, or C) require decontamination between soil samples collected within a core.

Decontamination between Each Core Hole

22. In his testimony, Mr. Churchill asserts that the "Work Plan" requires decontamination to be carried out between each core hole within a sampling area (a 20-point sampling grid). Mr. Churchill asserts that CDM violated its Work Plan by not doing so. His report specifies the violation of Section III.A.6. This is a false assertion. None of the attached Soil and Litter SOPs (Exhibits A, B, or C) require decontamination within a single sampling area.

Decontamination between Sampling Areas

23. In his testimony, Mr. Churchill asserts that the "Work Plan" requires decontamination to be carried out between each sampling area (a 20-point sampling grid). Mr. Churchill asserts that CDM violated its Work Plan by not doing so. His report specifies the violation of Section III.A.6. This assertion is not correct. As stated previously, Exhibit C is the standard against which CDM field crews should be evaluated. Field crews began the program with Exhibit A as the SOP. However, it quickly became apparent after the first LAL sampling (LAL5) that full decontamination procedures between LAL Sampling Areas were not necessary when the LAL Sampling Areas had similar topography and soils; and were subject to similar land use practices under the same grower. Land use practices include how the fields are utilized (pasturing) and fertilized. Under these circumstances, the degree of potential cross contamination between LAL Sampling Areas was evaluated to be insignificant and full decontamination procedures were not required between similar LAL Sampling Areas. Exhibit B was developed to reflect the new decontamination protocol and Exhibit C was developed to further clarify the SOP procedures applicable to the Oklahoma Poultry Project. CDM sampling crews were instructed to conduct full decontamination

procedures between LAL Sampling Areas only when biosecurity requirements needed to be addressed or the following LAL Sampling Area was significantly different from the LAL Sampling Area they were exiting. Biosecurity requirements called for full decontamination when crews left a LAL property or when travel to the next LAL Sampling Area required passing through public right of ways. Full decontamination was conducted between 54 of the 73 LAL Sampling Areas, primarily for biosecurity reasons and or because a different LAL was being accessed. For the remaining 19 LAL Sampling Areas, a core sample was collected and discarded at the LAL Sampling Area prior to sample collection in order to dislodge any material that may have been present in the core barrel from the previous LAL Sampling Area. Full decontamination for the 19 LAL Sampling Areas was not conducted because CDM evaluated the LAL Sampling Area to be similar to the LAL Sampling area being exited and access did not require passing through a public right of way.

The "Knife"

24. In Table 1 to his report, the issue of "Knife Dirty Prior to Sample Collection" was identified in one occurrence for LAL5-B. This represents one occurrence in 40 or more core samples collected from LAL5-B, and/or one occurrence in over 120 soil samples collected from LAL5-B. Mr. Churchill then characterizes that one occurrence as a "Compromised" field and a "Compromised" farm. Not only does Mr. Churchill fail to provide any kind of evaluation to demonstrate how the field or farm is compromised, Mr. Churchill's characterization of the field and farm as being compromised relative to this issue is false. As established, decontamination between soil samples within a sampling area was not required by any of the attached Soil and Litter SOPs (Exhibits A, B, or C). Mr. Churchill's Exhibit PI-D27 is also misrepresentative because it fails to provide any related

documentation demonstrating how a field, farm, spring, groundwater, or litter sample is measurably impacted and, thus, "compromised" by an identified observed issue. As noted in Roger Olsen's affidavit, the degree of cross contamination is not significantly measurable.

Clean Equipment

25. Mr. Churchill contends that the litter sampling was not conducted with clean equipment. All equipment used for litter sample collection within a grower facility was used one time. These items were left with the grower or disposed of depending upon the grower's preference. The shovel, hand trowel, and bucket were purchased at a hardware store and brought directly to the site. In several instances, mostly in the 2007 sampling, the label was left on the shovel. The label on the shovel was not removed to demonstrate that the shovel had not been used at any other location and to limit the exposure of litter to any label adhesive that can be difficult to remove at times. Furthermore, removing the label would leave the sticky adhesive residue on the shovel which could cause sample material to stick to the shovel. The label material itself was not deemed to pose a significant, measurable contribution to any of the primary analytical parameters. Very little, if any, of the labels left on the shovels were observed to have peeled off during the sampling effort.

E. "Cross-Contamination"

26. Exhibit H (attached hereto) is an Excel spreadsheet which provides the dry weights of each composite soil sample collected from the identified fields in Mr. Churchill's Table 1. CDM examined photographic evidence provided by CRA of select field issue observations. Based upon CDM field experience and comparative weight analysis, it would

appear that under the worst case scenarios identified in the CRA photographs, the following weight impacts from various cross contamination scenarios are estimated.

> Weight of material remaining in core between two sample depths – 2 grams;
> Weight of material remaining on knife between sample collection – 0.5 grams;
> Weight of cored cow manure incorporated into a 0-2 inch depth sample – 2 grams;
> Weight of material on outside of core being introduced to sample bag – 0.25 grams;
> Weight of material on a glove or finger that could be transferred to a sample – 0.1 grams
> (CRA photos show soil stained gloves, not actual granular material).

27. Mr. Churchill asserts that cross contamination, as he defines it in his testimony, compromises the data from a field. The average weight of composite soil samples from the 0-2 inch sample interval is 1.81 kilograms. The average weight of composite soil samples from the 2-4 inch sample interval is 2.03 kilograms. The average weight of composite soil samples from the 4-6 inch sample interval is 1.89 kilograms. Assuming a worse case scenario of all of the above cross contamination issues occurring for each sample collected, the total weight of transferred material in the 0-2 inch sample interval would be 4.85 grams per core location. According to Mr. Churchill's Table 1, the maximum number of times all five of the above cross contamination scenarios could have occurred is 21 for the entire program and no more than four times within any one sampling area, with coring through cow manure being the limiting factor. This degree of cross contamination is insignificant based on weight. For the worst case LAL Sampling area (LAL15-A) with four manure coring assertions, the worst case weight of the cross contaminated material would be 19.4 grams against a measured dry weight of 1260.8 grams. This translates to an insignificant 1.5 percent of the sample by weight.

F. Domestic Water Sampling

28. Mr. Churchill asserts that groundwater samples were collected directly from a garden hose attached to a well. The two incidences of sampling from a garden hose occurred when the landowner denied CDM permission to disconnect the hose. In one incidence sufficient purging was permitted by the landowner to eliminate concerns associated with incorporation of material on the garden hose into the sample. In the second incidence (on the Schwabe property), the landowner also refused to allow sufficient purging through the hose. This issue was noted in the field book and has been related to the staff evaluating the data from this well.

29. Mr. Churchill asserts that well samples were collected in several instances without sufficient purging. If a well is used on a frequent basis (daily or nearly daily), the need for purging is not as great as when a well is not frequently used. In the instance cited in Mr. Churchill's CRA report, the grower (Schwabe) did not allow CDM to purge for the requested time interval prior to sampling. In the instance of the Saunders farm, CDM field notes indicate an elapsed time of 17 minutes between the purging start and the sample collection. Mr. Churchill's characterization of 5 to 10 minutes does not coincide with CDM's field notes.

G. Spring and Groundwater Sampling

30. Mr. Churchill's assertion that collecting a groundwater sample directly from an unsterilized spigot is a violation of the Current Groundwater SOP (Exhibit G) is false. This SOP does not require sterilization of the spigot prior to sampling.

31. Mr. Churchill's report indicates that CDM collected bacteria samples in unsterilized containers. The lone incident cited was the Bill Anderson spring. I collected this sample and the sample was collected in a 500 ml sterilized container.

32. Mr. Churchill falsely asserts that CDM's collection of spring and groundwater samples into unpreserved containers violates the Current Spring and Groundwater SOPs (Exhibits E, or G). These SOPs allow for samples to be collected into unpreserved clean sample containers which were then shipped directly to the CDM laboratory in Denver for processing. This issue was not directly discussed in his testimony.

33. Mr. Churchill asserts that at least one of the spring samples was not representative as a result of stirred up sediment and CDM staff stepping in the spring before sampling and after walking down a path covered in cow manure. CDM's photos of the sampled spring do not show visible turbidity or evidence that the spring had been stepped in. In any event, spring sampling staff contends that spring sampling was not conducted while the spring was turbid. Exhibit I (attached hereto) provides CDM photos of the sampling of the spring in question (Saunders property). The Exhibit shows that the spring sampling location is not turbid and no visible suspended sediments are present as claimed by Mr. Churchill.

34. Mr. Churchill's CRA report asserts that cattle were in the spring at the Bill Anderson spring. The spring at this location is within a spring house and is physically isolated from cattle. It is a drinking water supply for a residential house on the property. The spring was discharging at an estimated 3 to 5 gpm and ran clear and was free of any observable sediment or debris. Mr. Churchill asserts that cattle were in the spring at one of

the Schwabe springs and the Saunders springs. While the springs are not isolated to prevent cattle access, no cattle were in either spring at the time the springs were sampled.

FURTHER AFFIANT SAYETH NOT.

I declare under penalty of perjury, under the laws of the United States of America, that the foregoing is true and correct.

Executed on the 29th day of February, 2008.

Darren L. Brown